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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,598	07/03/2003	Kenichi Takano	HT03-004	7267

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GEORGE O. SAILE
28 DAVIS AVENUE
POUGHKEEPSIE, NY 12603

EXAMINER

CHEN, TIANJIE

ART UNIT PAPER NUMBER

2652

DATE MAILED: 12/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/613,598

Applicant(s)

TAKANO, KENICHI

Examiner

Tianjie Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>09/26/2003</u> . | 6) <input type="checkbox"/> Other: ____. |

Non-Final Rejection

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1, 3-9, 11-17, 19-25, and 27-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Fukui et al (US 2004/0047087)

Claims 1 and 17: Fukui et al shows a method to enhance stability of a free layer/ or a magnetic read head having a free layer with enhanced stability and signal strength, ([0012]), while retaining free layer signal strength, in a magnetic read head in Fig. 1, including: providing a pair of opposing permanent magnet layers 107 made of CoCrPt ([0028] line 21) separated by a first gap and magnetized in a first direction, that abut and thereby provide longitudinal bias to the free layer; forming, at a distance above the permanent magnet layers, a pair of opposing additional bias layers 109 that are separated by a second gap that is equal to the first gap; and then magnetizing the additional bias layers in a second direction that is antiparallel to the first direction ([0013] lines 10-13).

Claims 9 and 25: Fukui et al shows a method to enhance stability of a free layer/ or a magnetic read head having a free layer with enhanced stability and signal

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strength, ([0012]), while retaining free layer signal strength, in a magnetic read head in Fig. 1, including: providing a pair of opposing permanent magnet layers 109 made of CoCrPt ([0042] line 12) separated by a first gap and magnetized in a first direction, that abut and thereby provide longitudinal bias to the free layer; forming, at a distance below the permanent magnet layers, a pair of opposing additional bias layers 107 that are separated by a second gap that is equal to the first gap; and then magnetizing the additional bias layers in a second direction that is antiparallel to the first direction ([0013] lines 10-13).

Claims 3, 11, 19, and 27: The method of claim 1 wherein the additional bias layer of CoFe is 10 nm in thickness ([0028] line 23) and the permanent magnetic layer of CoPtCr has a thickness of 30 nm ([0028] line 11). The additional bias layer is deposited to a thickness that is 0.02 microns (20nm) less than that of the permanent magnet layer.

Claims 4, 12, 20, and 28: Fukui et al shows that the first gap and the second gap should be the track width, which are between about 0.1 and 0.2 microns ([0008] lines 1-3; and Fig. 11).

Claims 5, 13, 21, and 29: Fukui et al shows that the distance above/or below the permanent magnet layer is the thickness of the intermediate layer, which is 5 nm (50 Angstroms) ([0042] lines 11-12).

Claims 6-8, 14-16, 22-24, and 30-32: Fukui et al shows the magnetic read head is a CIP GMR head/a CPP GMR head/a TMR head ([0049]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2, 10, 18, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui et al.

Claims 2, 10, 18, and 26: Fukui et al further shows the additional bias layer is CoFe/IrMn ([0044] line 9) whereby it has good exchange coupling field with antiferromagnetic layers. Fukui et al does not specifically state that the additional bias layer has an effective coercivity that is between about 0.05 and 0.75 times that of the permanent magnet layer.

However, Fukui et al shows that the permanent magnet layer should have coercivity of 2 KOe ([0029] lines 3-4). And the resulted coercivity is the difference between the coercivity of the permanent magnet and the coercivity of the additional bias layer. In instance case, the resulted coercivity is 1 Koe ([0029] lines 1-2), the coercivity of the permanent magnet is 2 KOe. Therefore, the effective coercivity of the additional bias layer is $2 \text{ KOe} - 1 \text{ KOe} = 1 \text{ Koe}$; which is 0.5 times that of the permanent magnetic layer.

Conclusion

3. The prior art made of record in PTO-892 Form and not relied upon is considered pertinent to applicant's disclosure.

US 6,385,017 to Min et al shows in claim 3 that CoPtCr is a permanent magnet.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tianjie Chen whose telephone number is (703) 305-7499. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chen Tianjie 11/24/2004
TIANJIE CHEN
PRIMARY EXAMINER